

## Studies on the Flora of the Guianas. 1.

### *Croton macradenis* (sect. *Podostachys*, fam. *Euphorbiaceæ*), a new species from the Guianas

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**Summary** : A new species of *Croton*, sect. *Podostachys* (*C. macradenis*) from French Guiana and Suriname is described. It has remarkable long glands. The distinctive characters of the species are the following : long, tubiform glands at the base of the leaves ; male flowers with a hairy receptacle and 5-6 anthers ; ovary glabrous ; pollen show the *Croton*-pattern. A comparative study between a number of species of the section is made.

**Résumé** : Une espèce nouvelle de *Croton* de Guyane française et du Surinam (*C. macradenis*), appartenant à la section *Podostachys*, est décrite. Elle a des glandes particulières. Des caractères spécifiques sont mentionnés dans la description de l'espèce ; notons entre autres : deux glandes longues à la base des feuilles ; fleurs mâles avec un réceptacle vil-leux et avec 5-6 étamines ; ovaire glabre ; pollen avec un « *Croton*-pattern ». Une étude comparative est faite entre quelques espèces de la section.

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Among the *Croton* collections recently made in French Guiana and Suriname, there are several specimens which can easily be distinguished by their remarkable long, tubiform glands at the base of the leaves. These specimens couldn't be identified properly, but resemble most species of the section *Podostachys*, especially *C. sipaliwinensis* Lanj. from the Sipaliwini savanna in S. Suriname. They have several features in common, but they differ in the long glands and in a few other characters. As the specimens do not fit into any described *Croton* species, the authors decided to assign them to the following new species.

#### ***Croton macradenis* Görts & Punt, sp. nov.**

*Frutex* 1/2-3 m altus. *Ramuli tereti pilis stellatis vestiti. Pylorum ramus centralis unus erectus rami laterales 5-7 adpressi. Petioli 3-45 mm longi, stellato-pubescentes. Lamina membranacea vel subchartacea, ovata, supra pilis simplicibus et secus nervos pilis stellatis nonnullis vestita, subtus stellato-tomentosa (pylorum rami laterales discum dentatum formantes), 3-9 cm longa, 1 1/2-6 cm lata apice acuta basi rotundata vel subcordata vel acuta, margine subtus glandulis patelliformibus minutis sparse instructa, biserrata; basi glandulis conspicuis patelliformibus, longe (2-4 mm) stipitatis munita; 3-5 nervia, nervis binis exterioribus inconspicuis. Stipulae subulatae, stellato-tomentosae vel strigosae, 2-7 mm longae, mox deciduae.*

*Racemi terminales et in axillis foliorum superiorum 1½-4½ cm longi, rhachi stellato-tomentosa, inter flores femineos et masculos spatio nudo ¾-2¼ cm longo interrupti. Flores subsessiles in axillis bractearum, flos femineus solitarius ima basi racemi, flores masculi multi. Bracteæ lineares vel tridentatæ 1½ mm longæ eglandulosæ pilis simplicibus. Flos femineus sepalis 6-7 linearibus vel oblanceolatis extus pilis stellatis vel et simplicibus vestitis intus glabris, post anthesin accrescentibus; petalis ignotis; stylis 3 ad medium bipartitis ramis bifidis pilis stellatis vel simplicibus munitis.*

*Flores masculi sepalis 5 ellipticis acutis circiter 1 mm longis eglandulosis pilis nonnullis simplicibus extus vestitis, basin versus ciliatis; petalis 5 ellipticis obtusis circiter 1 mm longis apice ciliatis eglandulosis; disci glandulis 5 parvis ellipsoideis truncatis; receptaculo longe lanato; staminibus 5-6 glabris.*

*Capsula glabra lævis 4-5 mm longa circiter 4 mm diametro. Semina nigra vel brunnea glabra leviter striato-foveolata 3-4 mm longa.*

TYPE : *De Granville B-5470*, Guyane française, piste de St.-Élie, Sinnamary, 9.6.1978 (holo-, CAY; iso-, U, P).

Shrub 0.5-3 m high. Branches terete, stellately pubescent. Hairs with a central erect branch and 5-7 lateral ones. Petioles 3-45 mm long, stellately pubescent. Lamina membranous to slightly chartaceous, ovate, 3-9 cm long, 1.5-6 cm wide; strigose above with a few stellate hairs on the midrib, stellately pubescent beneath (lateral branches of the hairs reduced); apex acute; base rounded to subcordate, sometimes acute, with conspicuous tubiform glands 2-4 mm long; margin strigose, biserrate with scattered short-stipitate patelliform glands; palmately veined with 3-5(-7) primary veins, primary and secondary veins flat above, prominent below. Stipules subulate, stellately tomentose or strigose, 2-7 mm long, caducous. Racemes terminal or in the axils of the upper leaves, 1.5-4.5 cm long, rachis stellately pubescent, the many male flowers subsessile in the upper part, widely separated (0.8-2.2 cm) from the solitary subsessile basal female flower; bracts linear, sometimes 3-dentate, 1.0-1.5 mm long, eglandular with simple hairs.

Male flowers : sepals 5, elliptic, *ca.* 1 mm long, eglandular, sparsely pubescent with simple hairs outside, ciliate in the lower half; petals 5, elliptic, *ca.* 1 mm long, apex obtuse, ciliate, eglandular; disc glands 5, ellipsoid, truncate at apex, small; receptacle long-villose; stamens 5-6, glabrous.

Female flowers : sepals 6-7, subspathulate to (ob)lanceolate, densely stellately and/or simple hairy outside, glabrous within, accrescent. Petals not seen. Ovary glabrous.

Capsule glabrous, 4-5 mm long, *ca.* 4 mm wide, smooth. Seeds black or brown, 3 mm long, glabrous, faintly striate-foveolate.

The name *macradenis* is formed out of macros (Μακρος) and aden (αδην) meaning great gland.

DISTRIBUTION : In sandy habitats in French Guiana and Suriname.

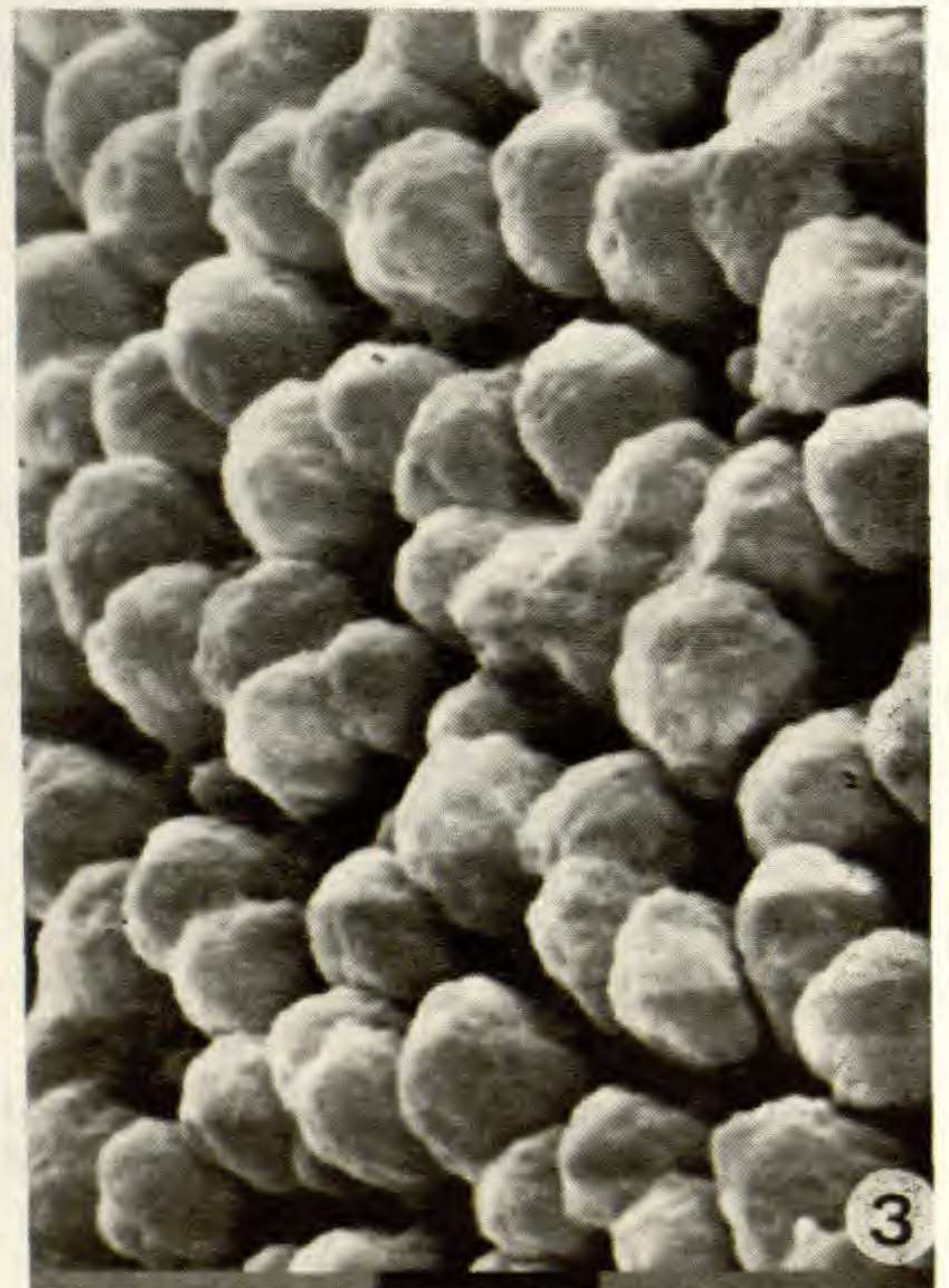
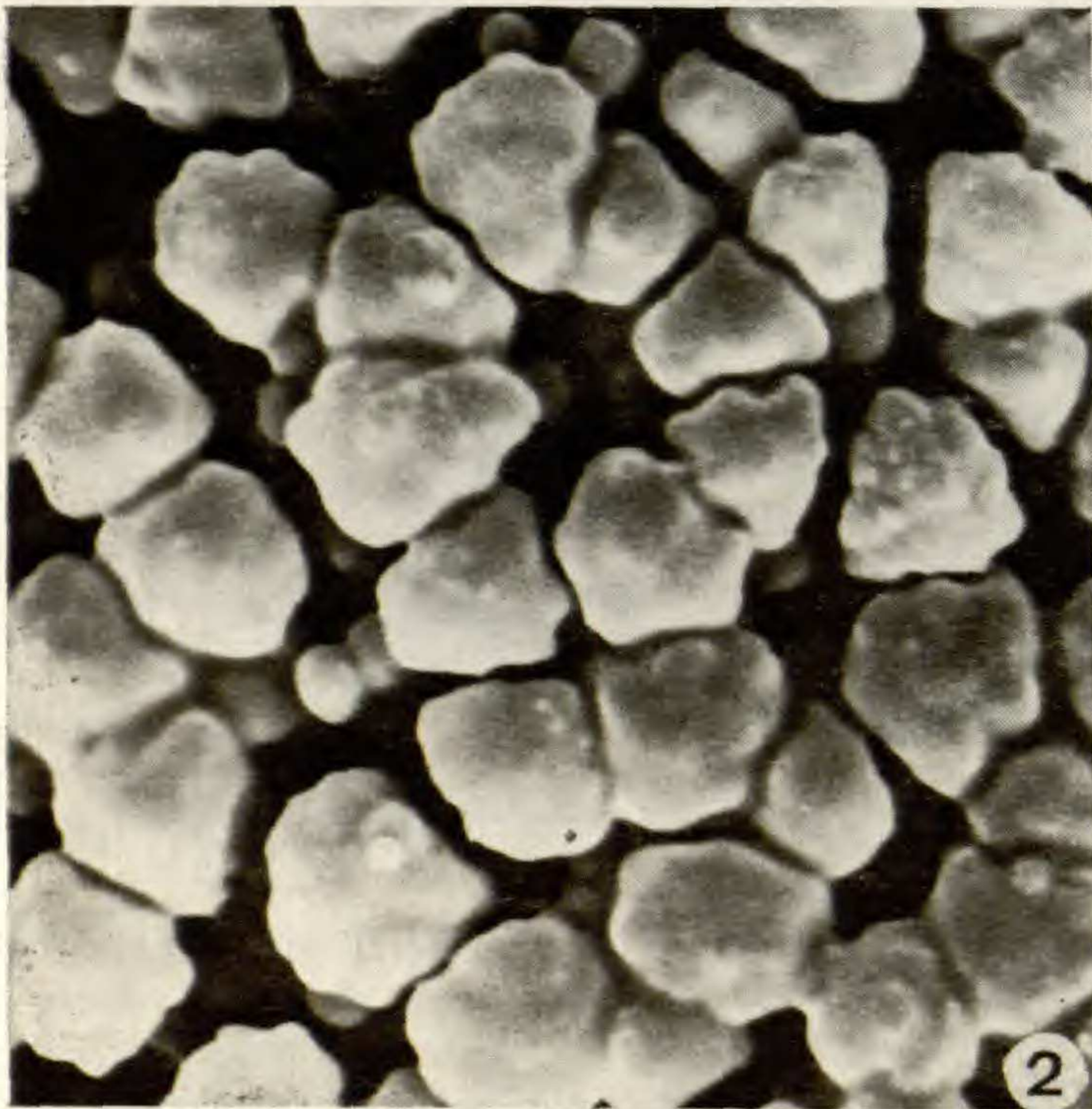
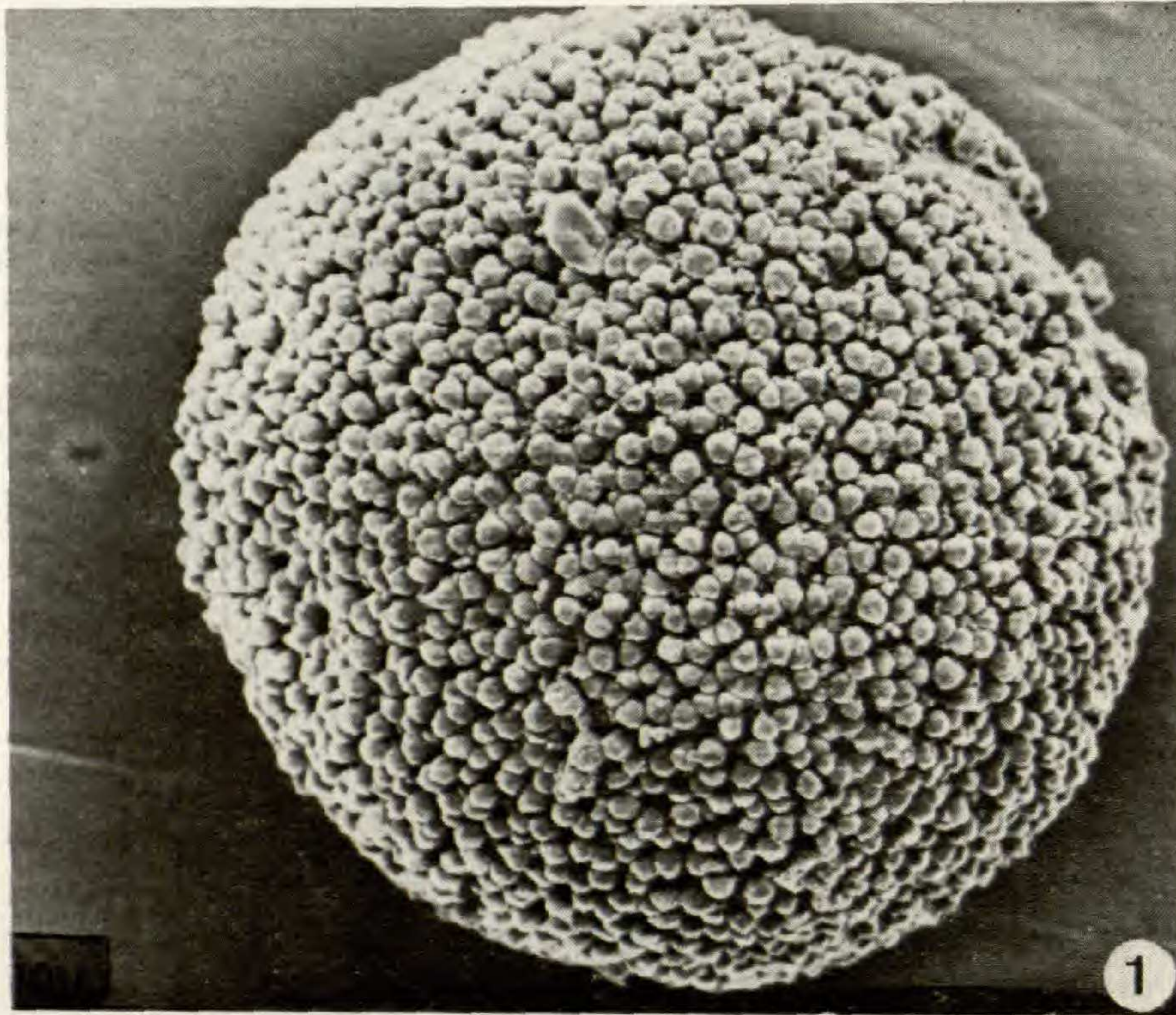
#### POLLEN

*Method of preparing* : Pollen grains were prepared by hydrating dry herbarium material in a solution of demineralized water and 1 % Wetting Agent. This was followed by treatment of acetone/water and sonification. Afterwards the pollen grains were transferred to 100 % acetone and from here mounted on stubs.



Pl. 1. — **Croton macradenis** Görts & Punt : **a**, Habit ; **b**, male flower and detail of sepal and petal ; **c**, detail with capsule. (*De Granville B-5470*, type).

*Description* : Pollen inaperturate, spheroidal ; sexine much thicker than nexine, consisting of clavate elements, usually 5 or 6 of these elements arranged in circles thus forming a so called "Croton-pattern", surface of the elements longitudinally grooved, ends blunt or somewhat acute ; in between the clavæ smaller elements present in the shape of granules or small bacula ; size *ca.* 55  $\mu$ m.



Pl. 2. — Scanning electron micrographs of pollen of *Croton macradenis* Görts & Punt (*De Granville B-5470*, type) : **1**, whole grains  $\times 1500$  ; **2**, Croton pattern ; sexine elements in surface view ; **3**, Croton pattern ; sexine elements in oblique view. (Scale represents  $2 \mu\text{m}$ ).

OTHER SPECIMENS : FRENCH GUIANA : *Descoings & Luu 20170*, S. de Tonate, Cayenne 16.1.1974 ; *Descoings & Luu 20471*, Route Iracoubo-Mana, 19.1.1974 ; *Oldeman B. 2564*, fleuve Oyapok, savanes roches « Sikini », 18.7.1969 ; *Veyret & Cremers 4358*, savane bordelaise, route de tour de l'île, Cayenne, 25.2.1977. — SURINAME : *Oldenburger, Norde & Schulz 498 B*, Sipaliwini savanne, W. of Morro Grande dome, 10.11.1968.

NOTE : The new species undoubtedly belongs to the section *Podostachys* (Klotzsch) Baillon because of its remarkable inflorescences. In the rather small racemes the female and male flowers are placed widely separated on the rachis.

Other species of this section are *Croton lundianus* (F. Dieder.) Muell. Arg., *C. sclerocalyx* Muell. Arg., *C. sipaliwinensis* Lanj. and *C. subserratus* Jabl. Differentiating characters of these species are mainly found in the glands at the top of the petiole or near the base of the leaf, in the number of anthers and in the indument of the receptacle of the male flowers and of the ovary (see table 1). Some minor differences are found in the characters of the leaves.

TABLE 1 : Differential characters in the section *Podostachys*.

	GLANDS AT LEAF BASE	RECEPTACLE ♂ FLOWERS	NUMBER OF STAMENS	INDUMENT OF OVARY
<i>Croton lundianus</i>	stipitate small ; < 2 mm	villous	6-12	hairy
<i>C. sclerocalyx</i>	sessile to sessile	glabrous	6	hairy
<i>C. sipaliwinensis</i>	sessile to sessile	villous	5-6	glabrous
<i>C. subserratus</i>	stipitate small ; < 2 mm	villous	?	hairy
<i>C. macradenis</i>	tubiform large ; > 2 mm	villous	5-6	glabrous

*C. lundianus* and *C. sclerocalyx* are well-known species of Central Brazil south of the Amazon River. The other two are rare species from northern South America. *C. subserratus* is only known from the type locality in Venezuela and *C. sipaliwinensis* is only known from a small area at the Suriname-Brazilian border.

The new species *C. macradenis* most closely resembles *C. sipaliwinensis* because of its glabrous ovary, hairy receptacle of the male flower and the small number of anthers. It differs distinctly in the large, long-stipitate glands, but also the leaves differ by their larger size, the longer petioles and the rounded subcordate base. Both species inhabit sandy places, e.g. savannas on sandy riverbanks.

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LITERATURE

- JABLONSKI, E. N., 1967. — Botany of the Guayana Highlands. Part 7. Euphorbiaceæ. *Mem. New York Bot. Garden* 17 : 80-190.
- LANJOUW, J., 1939. — New or noteworthy Euphorbiaceæ from Suriname. *Rec. Trav. Bot. Néerl.* 36 : 697-704.
- MUELLER, J. (Arg.) in MARTIUS, C. F. P., 1874. — *Flora Brasiliensis* 11 (2) : 1-752.